27
March
2024

WSH ADVISORY

Electrocution-related Workplace Fatal Injuries in 2H2023

In 2023, there were three fatal incidents involving electrical works, of which two occurred in the second half of 2023. Electrocution occurs when one comes into contact with anything that is electrically energised. The extent of the electrical injury depends on the amount, duration and path of the current passing through the body.

The WSH Council calls on all companies to put in place measures to protect workers from electrocution. The two fatal accidents below serve as a reminder that companies must take electrical works seriously.

Worker electrocuted during fan coil unit removal

On 22 July 2023, a worker was standing on a ladder to remove a fan coil unit located above the false ceiling when he received an electric shock. The worker managed to come down from the ladder and became unconscious subsequently. He was sent to the hospital and passed away.

The aluminium frame of the false ceiling opening was likely energised, and could have electrocuted the worker when his body contacted the frame.

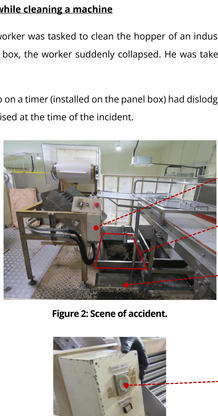

Figure 1: Scene of the accident.

Worker electrocuted while cleaning a machine

On 24 August 2023, a worker was tasked to clean the hopper of an industrial mixer. When squatting next to a control panel box, the worker suddenly collapsed. He was taken to the hospital where he passed away.

The plastic control knob on a timer (installed on the panel box) had dislodged, thus exposing a metallic screw, which was energised at the time of the incident.

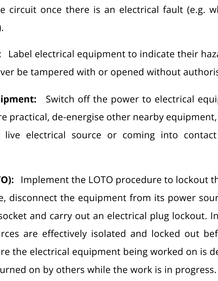

Figure 2: Scene of accident.

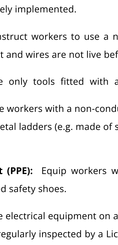

Figure 3: Close-up view of the control panel box with front panel in place.

What companies should do

Companies should assess and ensure that their WSH management system includes the following measures or checks:

- **Competent worker:** Deploy only workers who have been trained for electrical works and the energy lockout and tagout procedure. Electrical safety training should include electrical hazard identification, tools to be used, safe work procedure (including procedure for interfacing with control panels), use of personal protective equipment, rescue, and first-aid.
- **Circuit breaker:** Ensure electrical equipment are protected by a suitable circuit breaker that will safely break open the circuit once there is an electrical fault (e.g. when an arc or overcurrent condition is detected).
- **Equipment labelling:** Label electrical equipment to indicate their hazard(s) within and that such equipment should never be tampered with or opened without authorisation.
- **De-energise the equipment:** Switch off the power to electrical equipment before carrying out electrical works. Where practical, de-energise other nearby equipment, where there is a risk of the worker contacting a live electrical source or coming into contact with rotating or moving equipment parts.
- **Lockout Tagout (LOTO):** Implement the LOTO procedure to lockout the power switch in its "OFF" state. Where possible, disconnect the equipment from its power source by removing the power plug from its power socket and carry out an electrical plug lockout. Instruct workers to verify all electrical energy sources are effectively isolated and locked out before carrying out electrical works. This is to ensure the electrical equipment being worked on is de-energised before starting work and cannot be turned on by others while the work is in progress.
- **Electrical permit-to-work (PTW):** Implement a PTW system for electrical works. Before issuing the permit, onsite checks must be conducted by a competent person to ensure electrocution risk controls are in place and effectively implemented.
- **Pre-work electrical checks:** Instruct workers to use a non-contact-based voltage detector to confirm that electrical equipment and wires are not live before working with it.
- **Non-conductive tools:** Provide only tools fitted with a non-electrically conducting handle.
- **Non-conductive ladder:** Provide workers with a non-conductive ladder (e.g. made of fibre glass) for electrical work. Do not use metal ladders (e.g. made of steel or aluminium) as these are electrical conductors.
- **Personal protective equipment (PPE):** Equip workers with electrically resistant PPE such as insulated gloves and rubber-soled safety shoes.
- **Preventive maintenance:** Place electrical equipment on a preventive maintenance programme. Electrical equipment should be regularly inspected by a Licensed Electrical Worker or competent person to ensure they remain in good working condition. Damaged wiring and any signs of component discolouration, overheating, or unusual odours can indicate potential WSH issues. When in doubt, isolate the equipment and prevent its further use until all issues are rectified.

For more information, refer to the Electricity (Electrical Installations) Regulations, SS 638: 2018 Code of Practice for Electrical Installations, SS 571: 2011 Code of Practice for Energy Lockout and Tagout, and the WSH Council's WSH Guidelines on Safe Use of Machinery. For sample checklists on electrical safety refer to the Activity Based Checklist for Safe Electrical Maintenance Work and 6 Basic WSH Rules for Use of Electrical Equipment.

Under the WSH Act, first-time corporate offenders may be sentenced to the maximum fine of $500,000 whilst individuals can either be sentenced to the maximum fine of $200,000 and/or an imprisonment not exceeding 2 years. Read more on the WSH Act penalties.

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